LOS ALAMOS SCIENTIFIC LABORATORY
UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO 87545

OFFICE MEMORANDUM

TO :File

DATE: August 4, 1978

FROM :Margaret Anne Rogers, H-12 MAR

SUBJECT :Monthly Activities for July 1978

SYMBOL :H12-78-197

MAIL STOP: 490

1383 Report

Twenty-four percent of my time was spent talking with various people on various subjects. Fourteen percent was spent on the map per se, 28% on the joint study, 26% on a new geochemistry study, and 7% on the soil and vegetation survey. The equivalent of 17% of my time was put in above regular working hours. I attended a required safety orientation meeting and gave a talk to visiting Colorado State University students. Virginia Christie will submit a separate monthly report. Harmon Avery (Bausch & Lomb Representative) checked out the Stero-Zoom Transfer Scope. He will return in October with a design engineer.

Work During July 1978 toward objective (4) description of the geologic, biologic, and hydrologic pathways by which releases might occur.

The literature review associated with the analysis of the microprobe data ended. Karin Budding and I made 130 measurements on 8 slides to determine the Na-K-Ca ratio of feldspars from Units 1a, 1b, 2a, 2b, 3a, 3a(?), 3a(?). and 3b(?). Average feldspar values for each unit were given in Memo H12-78-183 (May 25, 1978). These averages ranged from $Or_{38}Ab_{62}An_{004}$ to $Or_{39}Ab_{60}An_{01}$. When comparing individual readings with the averages, there is very little variation in values. The ratios do not confirm sanidine (given as either $KAlSi_3O_8$ or (K,Na) $AlSi_3O_8$- $Or_{100}Ab_0$ to $\approx Or_{65}Ab_{35}$) as a common feldspar in the Tshirege. The averages fit the definition of anorthoclase, (Na,K) $AlSi_3O_8$ - $Or_{40}Ab_{60}$ to $Or_{10}Ab_{90}$, taken from the Glossary of Geology. Roy Bailey, U.S.G.S. (personal communication) recognizes anorthoclase only in the uppermost unit (his or mine) of the Tshirege. He and R. L. Smith, U.S.G.S., base their subdivision of the Tshirege in part on the recognition of either sanidine feldspar or anorthoclase feldspar in the tuff. Inferences can be drawn on the temperature of emplacement of the tuff from the identification of feldspars. The temperature of emplacement will then yeild information on the relative stability of minerals under present temperature conditions in relationship to weathering. Sanidine is a higher temperature feldspar than anorthoclase; therefore, anorthoclase should be relatively more stable.

I cannot account for the difference in findings between us and the U.S.G.S. Perhaps it is due to a different definition of anorthoclase; however, I have consulted three sources and the definition given above appears to be a conservative one. I do feel that a reading from the core, the

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intermediate area, and the rim of from 7 to 10 crystals per thin section (sample) rules out the probability that we failed to locate a sanidine crystal or that we happened to find the one crystal in the thin section which gave an anorthoclase reading. Furthermore, the readings were taken on crystals uniformably distributed across the thin sections. Since all readings are anorthoclase, I don't feel that having more samples (thin sections) from each unit would necessarily change the results. I don't propose any further investigation along these lines at this time. There could be some additional microprobe work done on Units 4 & 5 in the future.

The literature review on the microprobe data has generated a geochemical study on the Units of the Tshirge. Twenty-eight samples from Units 1 - 5 were submitted for Co, Cs, Rb, Ta, Th, U, W, and Zn analysis. These elements were chosen because they showed the greatest variation in values in a trace element study on the Bandelier Tuff in 1977. I am tryping to identify chemical trends in the various Tshirege units as a means of identifying the units away from outcrop eg. down a borehole.

The results from the Zn analysis are in. In general Zn decreases from bottom to top of the Tshirege. Furthermore, there seems to be very little overlap of values from unit to unit. More samples will probably be submitted to confirm this.

The report on the Pajarito Plateau joint study is two-thirds written. An extensive literature review has been done with the result that a method has been found to identify statistically significant trends - in other words to separate cooling joints from structural joints. Additional work on data analysis is progressing.

MAR:tj
cc: Dan Wilson
Merlin Wheeler
Tony Gallegos
Willy Abeele
Virginia Christie